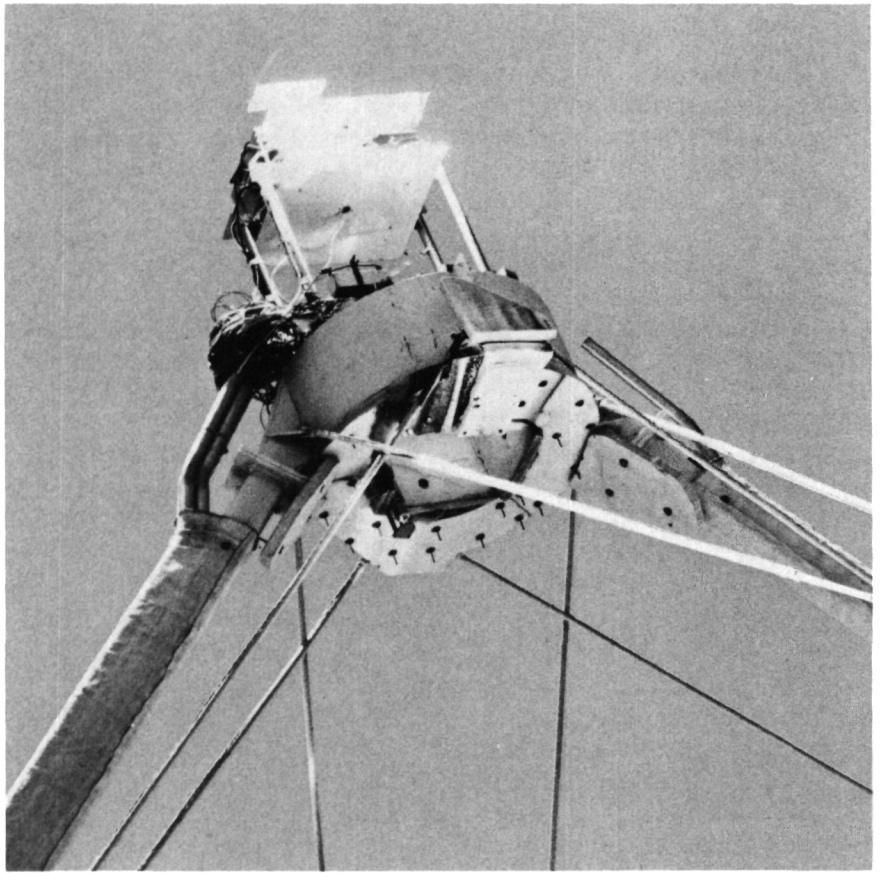
D2H

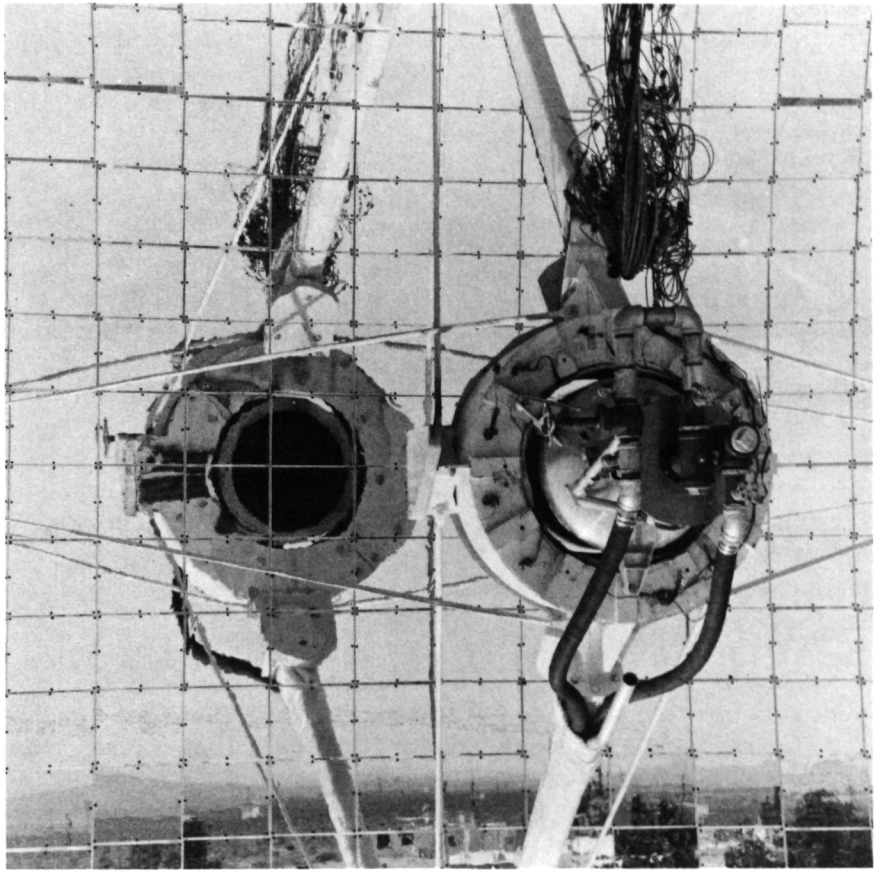
COLD WATER CAVITY CALORIMETER

This instrument converts concentrated insolation (solar energy) into thermal energy at or near the ambient temperature -- 38 degrees Celsius or less. The calorimeter uses the heat capacity of water flowing at up to 50 gpm through coiled copper tubing and measures the temperature rise due to the energy from the solar concentrator dish.

At ambient temperatures thermal losses are minimal. During calibration, for example, the device measured within 2.5 percent of the known power input. The calorimeter is designed to accommodate a nominal 90-kilowatt capacity concentrator which, at a 50-gpm flow rate, yields a fluid temperature rise of 6.82 degrees Celsius. The instrument uses apertures varying from 4 to 10 inches. With these, a correlation of energy concentration (in kilowatts) to aperature size is made to determine the thermal/optical efficiency of the concentrator.



Closeup of the Solar Concentrator Flux Mapper mounted at apex of test bed concentrator. The Solar Image Intensity Radiometer fits in top center of the flux mapper.



The Cold Water Cavity Calorimeter shown here monitors the temperatures on the concentrators.